

CARHART (D.M.D'A.)

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ERRORS IN SCHOOL
CHILDREN.

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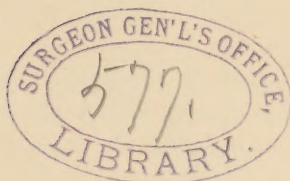
REPRINTED FROM THE

New York Medical Journal

for June 12, 1897.



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THE IMPORTANCE OF THE
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IN SCHOOL CHILDREN.*

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OCULISTS are frequently asked the reasons for the increase in recent years in the number of children wearing glasses. Twenty-five years ago it was the rare exception to see spectacles on the eyes of children, and few adults ever wore any glasses for distance, except in cases of high myopia. Even now I occasionally run across a person who still clings to the idea that only elderly people need to wear glasses, and then merely for close work.

Two causes have been operative in increasing the number of persons wearing glasses. First, the advancement of medical science has enabled the profession to correct many refractive errors which formerly were not

* Read before the Medical Society of the County of Westchester, N. Y., March 16, 1897.

recognized as such. Within five years the extended use of the Javal ophthalmometer has added an instrument of precision to the outfit of the oculist, while the advent of post-graduate schools of medicine and the reforms in methods of undergraduate instruction have given the general practitioner an appreciative clinical knowledge of ophthalmology. Not only is the general practitioner better able than ever before to do justice to his patient in making a correct diagnosis of refractive error, but the oculist has also gained in recent years through improvements in technique and inventions of new instruments. In the pioneer days of ophthalmology the few oculists gathered in the large cities laid the foundations of our science wisely and well, and we are now enjoying the results of their labors. So great has been the diffusion of the practice of ophthalmology that nearly every town of any size has now the benefit of the services of an oculist.

The second cause for a larger number of persons wearing glasses at the present time than in former years is that every one uses his eyes much more extensively for close work than did his immediate ancestors. The daily newspaper is an example of the many new factors in the production of eye strain inherent in our complex civilization. As knowledge has deepened, and culture has expanded, we have required more of our children, and so the schools, public and private, put much greater burdens upon the rising generation than did the district schools of bygone days. Dictation exercises play now a large part in the method of instruction, much to the detriment of weak eyes. There is a real danger in the present tendency to crowd the greatest possible acquisition of knowledge into the years of childhood and early

adolescence. Healthy eyes, with little or no refractive error, bear with apparent impunity a surprising amount of overwork, but any considerable refractive error or any local or constitutional disease or dyscrasia at once inserts an element of danger into the close application to study necessary to keep up in the classes of our schools and academies. It may be doubted whether the eyes of the children of the present generation are intrinsically any weaker or more diseased, as a rule, than the eyes of their forefathers were, but it is evident that the demands of school life of to-day have necessitated a great increase in the aid given by glasses.

The eyes of the human race seem to be passing through a period of adaptation to meet the new conditions of our modern civilization. Man in the state of savagery is farsighted, as are most if not all animals. A very small amount of nearsightedness would severely handicap a savage in the struggle for existence, and any tendency to myopia in prehistoric man was undoubtedly ruthlessly cut short by the sure survival of the fittest. Infants are now born hypermetropic, an atavistic proof of their origin. Civilization has totally changed the environment of man. The horizon of the savage was the boundless prairie or the lofty hilltops. His civilized brother finds his vision bounded by city walls and his accommodation taxed continually by books and newspapers. It is an axiom of physiology that a functionally active organ attracts an abundant blood supply. Continual application to close work, especially during the years of childhood and early adolescence, when the tissues of the immature eyes are soft and yielding, causes first a congestion of the entire organ, and then a yielding of its structure. This yielding of the eyeball occurs both

at its posterior pole and at its anterior surface, the first causing a lengthening of the optic axis and the second the development of astigmatism due to alteration of the curve of the cornea. As the eyeball lengthens the refraction of the eye tends to become myopic. In so far as this change helps to bring the focus for useful vision nearer, it is a distinct advantage over the farsighted eye, so necessary to the savage. But, unfortunately, myopia caused by congestion is usually if not always a progressive pathological process, bringing attendant diseases in its train, and secondly the development of astigmatism is an unmixed evil in all cases, causing, as it does, marked impairment of vision and asthenopia.

What will be the final effect of the strain of civilization upon the refraction of the eyes is hard to say, but it is to be hoped that extreme myopia will not be our manifest destiny. The salvation of the race undoubtedly rests in this, as in other things, with the child. When once myopia and astigmatism have developed, humanity demands that these imperfect eyes be protected by glasses, thus aiding the survival of the unfit so far as vision is concerned. But in childhood we can prevent the development of the evils which in adults we can only palliate. By avoiding as far as possible abuse of the eyes under unhygienic conditions, and by prompt and exact correction of every refractive error, we can prevent harmful congestion of the delicate tissues of the immature eyeball and escape that distention which causes high refractive error. Indeed, it is claimed that high degrees of myopia have distinctly decreased in frequency in the large cities of recent years, and, if the facts are as claimed, the benefit of proper treatment is strikingly demonstrated, since city life is exceedingly favorable to the development of distention

of the eyeball, and immigration is constantly increasing the population of the Atlantic seaboard with foreigners of low vitality and inherited tendency to disease.

In the early stage of the process of distention, when the eyeball is still hypermetropic and when the degree of astigmatism is not large, exact correction of the refractive error is very effective in arresting its development. The case book of every oculist is filled with instances of relief of symptoms of asthenopia following the prescription of proper glasses. So slowly does distention progress in its incipency, and so effective at that time is proper treatment, that only recently have the development of astigmatism and the transformation of hypermetropia into emmetropia and thence into myopia been demonstrated satisfactorily. Increase of myopia being more rapid and frequent, as was to be expected of the later stage of the process, has been often observed, and myopic astigmatism for the same reasons has been long known to develop and increase, while hypermetropia and hypermetropic astigmatism have both been usually supposed to be congenital and fixed. This process of distention goes on, as may be easily inferred, more surely and quickly in eyes weakened by local or constitutional disease or dyscrasia, and such eyes are instances of so-called essential myopia. I have recently seen the *Report of the Elmira Reformatory* for the year 1896, and in the medical portion of the report I note the statement that high degrees of astigmatism and of myopia are prevalent, which would go to show the pathological character of ocular distention in these degenerates.

While examining the eyes of one thousand school children, in preparation for a paper read before the Ophthalmological Section of the New York Academy of Medi-

cine,* I was much impressed with the importance of exact correction of every instance of refractive error, by observing numerous cases of blepharitis and of asthenopia occurring in children either wearing glasses manifestly of improper character or wearing no correction at all. Public opinion outside of the large cities does not yet realize the danger of neglect of exact correction of refractive error, and too often it is supposed to be safe to intrust the fitting of glasses to refracting opticians, jewelers, and other persons with optical goods to sell. For children such a course is even more hazardous than for adults, since the congestion of the easily distensible eye of childhood is aggravated by wearing glasses of improper character, while the adult eye, in addition to being more intolerant of a wrong glass, is more unyielding and less likely to receive permanent injury. The determination of the refraction of children, even for oculists, is often of exceptional difficulty, owing to spasm of accommodation and a multitude of other reasons. In unskilled hands the chances of a correct estimation of astigmatism, for instance, are small indeed, and it is not remarkable that so many children have the strain of hypermetropic astigmatism made harder to bear by being compelled to wear minus spherical lenses, which, by stimulating the accommodation, hasten the tendency to myopia. I am sure the profession will agree with me that the determination of refractive error is, and should be, a part of medical practice, and that the present custom in country towns of allowing men not graduates in medicine to fit glasses is pernicious to the last degree, since it puts into unskilled

* The Refraction of the Eyes of One Thousand School Children, with Particular Reference to Astigmatism, as Shown by the Javal Ophthalmometer. *New York Medical Journal*, April 17, 1897.

hands a task which requires all the judgment and diagnostic acumen of an experienced oculist to perform with safety and success. The delicate tissues of the eyes of our children are too sacred to be tampered with by any one who has taken a few weeks' course in some school of optometry. I have before me a copy of a "diploma of graduation" of such an "optical institute" given as a certificate of being "duly qualified to practise theoretical and applied optics." The law is very much in the way of these gentlemen, as a regent's certificate is necessary to practise medicine in this State, and so the bill defeated last year has been once more introduced, in an amended form, entitled "An Act to Regulate the Practice of Optometry in the State of New York." It is to be hoped the protests of the profession represented by committees of this society and others, ably seconded by many of the manufacturing opticians, have been heeded for this session of the legislature at least, but eternal vigilance on our part will be required lest the influences supporting the bill rush it through at some other session, or even in the last hurried days of this one. This bill legalizes the present gross infringement upon medical practice, and refracting opticians, graduates in optometry, whatever that may be, and any others, need only to receive a license from a State board of examiners in optometry to be put upon the same footing in law as any member of our profession for the treatment of optical defects by correction of refractive error. I will not weary you by reciting instances of harm done by the mistakes of these gentlemen. Any oculist can give numbers of cases where glasses have been placed on eyes afflicted with lenticular opacities or in advanced stages of retinal disease, while improper correction of refractive

error is the rule with them and not the exception. Only one of this State board of examiners is required to be a physician. The others need have little or no medical training whatsoever, and yet their license under this new bill would give the public to understand that holders of such certificates were fully competent to make a correct diagnosis of refractive error and to apply the proper treatment. It should never be possible to turn over medical practice in this way to those who have not secured a degree of doctor of medicine.

In conclusion, I think I have shown that refractive error in civilized man is due to the changed conditions of his environment, and that childhood represents the critical period of life when proper treatment is of supreme importance. The strain of accommodation caused by the increased demands of modern schools in the effort to crowd into the early years of childhood a superficial knowledge of a multitude of subjects has resulted in harmful congestion of the delicate ocular tissues. In the plastic years of childhood the eye is soft and yielding, and ocular distention, both anteriorly and posteriorly, is the natural consequence of undue strain. Increase of the optic axis, or tendency to myopia, is more marked because the eyeball is weaker at its posterior pole, but alteration of the curve of the cornea, causing astigmatism, also occurs in the majority of cases. The bright side of the picture is that exact correction of refractive error in childhood usually arrests its development, and once safely past the years of immaturity the adult eye does not often succumb under hygienic conditions, with good health and strong vitality, to the ordinary demands of civilization.

Since the foregoing was written, the following events

have occurred: Assembly bill No. 459, as amended, No. 840, was reported favorably by the committee on general laws, but failed of passage by three votes. Senate bill No. 1001 perished in committee, thus ending the matter for this session. But the *Optical Journal* says the bill will undoubtedly be very much alive again at next winter's session. However, we may hope that experience gained this year will enable the profession to continue their successful resistance against such measures.

NO. 147 WEST FORTY-FOURTH STREET.

The New York Medical Journal.

A WEEKLY REVIEW OF MEDICINE.

EDITED BY

FRANK P. FOSTER, M.D.

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PUBLISHED BY

D. APPLETON & CO., 72 Fifth Avenue, New York.

